WHAT IS CLAIMED IS:

1. A semiconductor device manufacturing method, comprising:

a first step of forming a laminated structure by adhering, on a semiconductor substrate including a plurality of integrated circuits, a carrier member covering a region in which the plurality of integrated circuits are formed, with an insulating resin interposed between the semiconductor substrate and the carrier member;

a second step of cutting on the laminated structure so as to cut the semiconductor substrate together with the insulating resin while allowing at least a portion of the carrier member to remain uncut; and

a third step of dividing the laminated structure by cutting the carrier member; wherein

the second step is performed while cooling a dicing saw used to cut into the laminated structure including the semiconductor substrate.

2. A semiconductor device manufacturing method as defined in Claim 1, wherein the second step is performed while the cooling is executed by spraying a coolant on the dicing saw.

3. A semiconductor device manufacturing method as defined in Claim 2, wherein the second step includes spraying the coolant on the dicing saw along a rotating direction of the dicing saw at an angle of elevation of between 5° and 45°, inclusive.

4. A semiconductor device manufacturing method as defined in Claim 2, wherein the second step includes spraying the coolant with a spraying width larger than the width of the dicing saw.

5. A semiconductor device manufacturing method as defined in Claim 2, wherein the coolant used in the second step is obtained by passing tap water through an RO film.

6. A semiconductor device manufacturing method as defined in Claim 2, wherein the second step is performed while the cooling is executed by spraying on the dicing saw a coolant having a pH value of between 4 and 6, inclusive.

7. A semiconductor device manufacturing method as defined in Claim 1, further comprising:

a step of forming metal wiring on a machined surface of the laminated structure created in the second step.